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*Journal of Arizona Medical Association*

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## Original ARTICLES

### OTHER USES OF DIONOSIL (A PRELIMINARY REPORT)

Samuel L. Cohen, M.D.  
Phoenix, Arizona

IN 1922 Sicard and Forester first used iodized oil (lipiodol) and for thirty years it has remained the established medium for bronchography. Lipiodol, however, has certain disadvantages:

1. Persistence.
2. Iodism.
3. Alveolar filling.
4. Occasional allergies.
5. Difficulty in handling (proper warming, etc.)

Dionosil has recently come into use for bronchography and is a suspension of a N-propyl ester of 3:5 diodo - 4 pyridone - N acetic acid. In 1953 Tomich Basil & Davis investigated the behavior of Dionosil in the laboratory and on animal experimentation. They found that in four days the ester is completely hydrolized - absorbed into the blood stream and excreted without change in the urine.

Iodine or iodides are not liberated, which reduces sensitivity reactions and does not alter blood examination for iodine.

Aqueous Dionosil is a 50% suspension, buffered, and containing a sterilizing agent. Oily Dionsil is a 60% suspension in peanut oil.

Extensive animal and laboratory work showed that Dionosil could be given intramuscularly, subcutaneously or intraperitoneally and orally with no toxic effects. A large amount is necessary for it to be lethal intravenously to a mouse.

Histologic examination of lungs after bronchography showed a mild inflammatory reaction in a few cases which subsided in a few days. This is also present with lipiodol.

With Dionosil:

1. The lungs are clear in 4 days. In abscess cavities it may take 14 days to absorb.
2. The bronchi stay outlined well up to 1 hour so no hurry is necessary and coughing does not ruin the picture.
3. Alveolar filling is rare and more medium can be introduced if additional study is required.
4. The bronchi is outlined rather than filled. (Fig. 6)



Fig. 6: A normal bronchogram with a aqueous Dionosil showing a nice mucosal picture.

Since no iodine is liberated it is safe to use with patients with tuberculosis. Sensitivity is rare and there are no delayed allergies. Side effects of Dionosil are few; we mention two.

1. Occasional rare febrile reactions occur accompanied by a cough and influenza symptoms. This lasts 1-2 days and requires no therapy.

2. An occasional bronchospasm has occurred.

The technique for Dionosil bronchograms is the same as for lipiodol.

The question arose, would Dionosil work in other types of examinations? From previous readings we knew Dionosil was non-toxic, absorbable and clung to mucosal surfaces. Strepler in 1953 used it to outline a thyroglossal duct and a tuberculous fistula.

We first tried it on a retrograde pyelogram. (Fig. 1) The patient had an obscure hematuria. Routine retrogrades with Urokon were negative. The examination with Dionosil was also negative but most important the calices, pelves and ureters remained outlined sufficiently well for re-examination in one hour. No ill effects occurred to the patient. The contrast and detail equalled that of Urokon.

Next we examined several paranasal sinus cases with excellent demonstration and outlining of the mucosa. (Fig. II)

Oily Dionosil is not recommended for these sinus films because of low rate of absorption.

We next tried it with esophageal varices. (Fig. III) Here, too, we demonstrated the varices very well up to 30 minutes. Actually, however, there was no real advantage over the thick barium except, perhaps, in cases where lower bowel obstruction or esophageal obstruction is present.

Our most recent trial was with post-operative T-tube cholangiograms. Here we have a case which I believe demonstrates the stones very well. More important, the aqueous Dionosil stays and coats the hepatic duct system and stones up to two hours allowing less hurried and more technically perfect films, and, therefore, more accurate diagnosis. No reactions occurred. The material is water soluble and can be washed from the biliary system if desired.

These few things we have done. Much more work and evaluation need to be done. We hope in the future to try the Dionosil in other examinations where an absorbable contrast material is used.

### Summary

The use of Dionosil in diagnostic procedures other than bronchography is described. It is



Fig. 2: Left Retrograde Pyelogram. Immediate film after use of 30% Urokon.



Fig. 2: Left Retrograde Pyelogram 30 minutes after the use of aqueous Dionosil. Note the outline of the ureter.



found of value in retrograde pyelography, visualization of nasal sinuses, esophageal varices, and cholangiograms.



Fig. 3: Sinogram with aqueous Dionosil. Note the mucosal outline of polypoid changes.

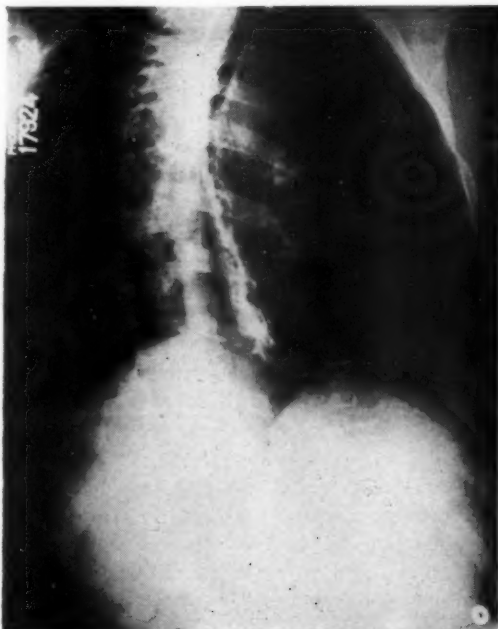


Fig. 4: Esophagram. 15 Minutes after aqueous Dionosil large varices are seen.



Fig. 5: T-tube Cholangiogram. The ducts and stones were nicely outlined up to 1 hour.

Further investigation is needed.

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## THE HEART IN CHRONIC PULMONARY DISEASE\*

by

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and

Onie D. Williams, M.D.

**T**HE physicians of the Southwest are keenly aware of the dangers of pulmonary hypertension with cor pulmonale in chronic pulmonary disease. This area, as well as other areas having low humidity warm climates, is a mecca for many people from other sections of the country with diseases causing pulmonary fibrosis, such as bronchiectasis, tuberculosis, emphysema, kyphoscoliosis and bronchial asthma. In addition, patients who have had thoracoplasty or pulmonary lobectomy frequently come to this climate in the hope of minimizing the frequency of respiratory infections which they are subject to in other sections of the country. Also, this is an area in which retirement of elderly persons with past pulmonary infections or pneumoconiosis is not uncommon. Although thoracoplasty and pneumonectomy themselves do not result in pulmonary hypertension, those persons who have undergone these procedures begin to have arterial changes which may result in cor pulmonale when they reach an older age. Other causes of pulmonary arterial obstruction which may result in cor pulmonale, but are rarely seen, include multiple small pulmonary emboli, vascular spread of tumor emboli to pulmonary arteriosclerosis. These should be kept in mind for consideration when the more obvious etiologic factors are not apparent.

Three phases of cor pulmonale might be considered. First, acute right heart failure associated with a massive infection superimposed on chronic pulmonary fibrosis and emphysema. Second, a subacute or recurrent type of right heart failure which may be apparent only with associated pulmonary infections. These may respond to treatment directed at relieving the infection, but always carry the possibility of progression into acute cor pulmonale. Third, the chronic type in which there is definite hypertrophy of the right heart and a continuous high intrapulmonary pressure resulting a pulmonary edema, pleural effusion, enlargement of the liver, ascites, and peripheral edema.

Phases of acute cor pulmonale are very seldom diagnosed at autopsy unless associated with pleural effusion, liver enlargement or ascites. Pulmonary edema and dilatation of the chambers of the right side of the heart alone are certainly insufficient findings for making an anatomical diagnosis of cor pulmonale. Pulmonary edema may be associated with respiratory infections without underlying cause for pulmonary hypertension. Furthermore, the chambers of the heart may be dilated, particularly if the heart stops in diastole. Neither measurement of the valves, nor any other criteria the pathologist may have can give a definite indication of whether the patient died from an acute right heart failure. The recurrent or subacute type of chronic right heart failure with dilatation and hypertrophy of the right heart is not so difficult to determine at autopsy. Here the evidence of myocardial hypertrophy of the right ventricle is found, as well as enlargement and chronic passive congestion of the liver, ascites, and peripheral edema.

The pathology of pulmonary hypertension is essentially that of the vascular changes associated with chronic pulmonary disease. These consist of fibrosis, narrowing, thrombosis or complete obliteration of the capillaries and arterioles. Anoxia also probably plays a significant role, both in systemic and pulmonary hypertension and hypertrophy of the heart. In a person with vascular changes associated with pulmonary fibrosis, a superimposed infection may so limit the blood supply and produce anoxia as to result in acute cor pulmonale.

We are at this time reporting 3 cases presenting features of the different types of cor pulmonale with heart failure as seen at autopsy.

**Case Number 1** is an 84 year old man who entered the hospital because of pulmonary hemorrhage, anemia, and fever. At the time of admission he had a temperature of 99.2 degrees F. and a blood pressure of 120/90. During hospitalization, the patient continued to have fever up to 103.8 degrees. He was known to have bronchiectasis, and by x-ray there was

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a bronchiectatic cavity in the right apex of the lung. Spontaneous fracture of several ribs occurred during his hospital course, possibly the result of coughing. At autopsy, this patient was found to have a diffuse bronchiectasis with a bronchiectatic cavity and a fairly diffuse early bronchopneumonia. His heart weighed only 300 gms. There was considerable sclerosis of the coronary arteries, but no areas of occlusion were found, and from the appearance of the heart there was no cor pulmonale. However, there was pulmonary edema with acute congestion of the liver and abdominal ascites.

This patient apparently represents a case of acute right heart failure. The evidence consists of edema of the lungs with chronic passive congestion of the liver and ascites. Blood vessels in the lungs were not remarkable. Muscular ulceration of a bronchus was found as the cause of his pulmonary hemorrhage.

The second case is that of a 65 year old man who entered the hospital with a chief complaint of swelling of the ankles. He had a known bronchiectasis for many years and previously had had an episode of heart failure at which time he was placed at rest and was digitalized with some improvement. At the time of admission he had been without digitalis for three years and apparently had adequate cardiac compensation. At this time, however, his condition became progressively worse and he developed orthopnea, dyspnea, ankle edema and productive cough. The liver was not total of 1,010 grams. There was marked fusiform dilatation of all bronchial passages, particularly in the lower lung lobes. There was a grade III pitting edema of the lower legs and ankles. Ascites was present, as was a slightly enlarged liver weighing 1500 gms. The heart weighed 410 gms. The myocardium of the right ventricle was approximately twice normal thickness. Microscopically, the sections of the lung showed advanced pulmonary fibrosis with areas of purulent bronchopneumonia, bullous em-

physema, and well defined thickening of the walls of the small muscular pulmonary arteries. This case represents a recurrent or subacute type of cor pulmonale with hypertrophy of the right ventricle due to past episodes of increased pulmonary hypertension. The vascular changes, while they might be secondary to pulmonary changes, in all probability were the cause of the increased tension in the pulmonary bed and subsequent cor pulmonale.

The third case is that of a 63 year old woman who entered the hospital in a critical state and died 6 hours later. She was known to have pulmonary fibrosis, bronchial asthma, emphysema and chronic right heart failure. At autopsy, the lungs weighed a total of 1,000 gms. The right upper lobe was fibrous and small and there were numerous emphysematous blebs and many cavities filled with yellow caseous material. The liver was only slightly enlarged, weighing 1350 gms. However, the heart weighed 580 gms. There was a definite grade II atherosclerosis present in the coronary arteries and a definite hypertrophy of the left ventricle. Microscopically, the lungs showed areas of vascular thrombosis, thickening of the alveolar septa and increased thickening of the walls of the smaller arteries. This case represents a chronic cor pulmonale from pulmonary emphysema resulting from asthma and showed definite pulmonary arteriolar changes.

**Summary:** In summary, three cases have been presented representing the phases of cor pulmonale, that is acute, subacute (recurrent), and chronic, which physicians in this area are likely to see associated with chronic pulmonary disease. Right heart failure of the acute type is rarely seen by the pathologist at autopsy, but is well known by the clinicians as a clinical entity. The more chronic phases may be superimposed on previous pulmonary fibrosis, infection or with occlusive vascular changes, similar to those seen in systemic hypertension and left ventricular hypertrophy.



## A TECHNIQUE OF INTRAVENOUS PENTOTHAL SODIUM-SUCCINYLBCHOLINE ANESTHESIA FOR BRONCHOSCOPY AND BRONCHOGRAPHY (A REPORT OF 600 CASES)

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**B**ECAUSE bronchoscopy and bronchography are psychologically formidable procedures for most patients and many referring physicians, it seemed desirable to attempt to evolve a technique of intravenous anesthesia which would be safe and of minimal morbidity, would increase the efficiency of the bronchoscopist, and would give technically better bronchograms. A combination of Pentothal sodium for narcosis and amnesia with succinylcholine for muscular relaxation was considered to offer the best possibilities.

This presentation is a description of the technique used in 600 bronchoscopies and 285 bilateral bronchograms since early 1952. There have been no deaths, no serious operative or postoperative difficulties or complications, and no apparent drug or opaque medium reactions. Acceptance of the procedure by patients and referring physicians has been most gratifying.

Succinylcholine is a controllable muscle relaxant, prompt and effective, of short duration, and with minimal side effects. (1)(2) Contraindications are those conditions characterized by decreased plasma cholinesterase activity which may intensify and prolong its action, namely, severe liver damage, severe anemia, and severe malnutrition. In no patients in this series were there any apparent ill effects from the succinylcholine.

Pentothal sodium is accepted as an ultra short-acting barbiturate for intravenous use in an average dose of 1 gm., with rapid induction and limited to procedures of 15 to 20 minutes duration.(3) Contraindications are said to be liver and kidney diseases; circulatory disturbances and anemias; acidosis; extremes of age; chronic pulmonary diseases with low vital capacities; and respiratory obstructions, acute and chronic.

During the development of this technique due respect was held for the contraindications of both drugs, with particular reference to the cardio-pulmonary diseases. However, as the study progressed, accumulated evidence lessened the degree of the contraindications. Acute and chronic asthma, advanced pulmonary

emphysema, right heart strain, advanced bilateral pulmonary tuberculosis, respiratory acidosis, and other causes of marked reduction in respiratory function have proved to be no contraindication to the technique as here used. Nevertheless, experience with the technique would seem advisable before reducing the contraindications below those usually considered safe. It is reported that the spasmogenic effect of Pentothal sodium may initiate severe laryngospasm or bronchial spasm during instrumentation of the pharynx and larynx. For this reason topical anesthesia has been advised as an adjunct to intravenous barbiturate anesthesia.(4) In this series, using the combination of Pentothal sodium and succinylcholine, there were no apparent instances of laryngospasm or induced bronchospasm.

Case 1 is typical of a group of 62 patients, 60 years of age or older, with chronic bronchospastic bronchitis and advanced pulmonary emphysema on whom bronchoscopy was performed without operative or postoperative mishap. Case 2 is representative of a group of 24 children from 6 to 10 years of age, who had bronchoscopy and bronchography with similar freedom from ill effects. Case 3 characterizes a group of 75 patients on whom bronchoscopy was performed for relief of persistent status asthmaticus with no operative or postoperative morbidity.

### TECHNIQUE

The operative team consists of the bronchoscopist, the anesthesiologist, a number one and a number two nurse, and an X-ray technician when bronchography is done. The bronchoscopist directs the overall pattern of the procedure. The number one nurse assists the bronchoscopist and injects the opaque medium at bronchography. The number two nurse holds the head at bronchoscopy and assists in positioning the patient during bronchography. In bronchography the patient reclines on the horizontal fluoroscopy table. Bronchography is always preceded by bron-



choscopy. This has proved to be advantageous in cleansing the bronchi for better distribution of the opaque medium as well as for diagnosis and therapy. Usually no preoperative medication is used unless the presence of bronchospasm indicates the need for Aminophyllin either intravenously or by suppository. If the patient has received cortico-steroids, 100 mg. of Solu-Cortef is given intravenously about one hour preoperatively. An occasional patient requires Dramamine, 25 mg. intramuscularly for alleviation of postoperative nausea.

The infusion set consists of a 20 c.c. syringe with a three-way petcock attached via a short plastic or rubber tube to a 20 gauge needle. The flask of succinylcholine, suspended from an adjustable intravenous stand, is connected to the petcock with plastic tubing. The syringe is filled with 2½% Pentothal sodium solution, the needle is inserted into a vein in the right forearm, and both needle and syringe are securely affixed to the forearm by 1-inch adhesive. The forearm is then firmly strapped to the armboard.

Induction is accomplished by injecting 8-10 c.c. Pentothal sodium, depending upon the patient's weight and the usual anesthesia variables. When bronchoscopy is done for status asthmaticus or on any patient with severe respiratory disability, the minimum amount of Pentothal necessary for amnesia is used. The succinylcholine drip is then allowed to run at 40 to 50 drops per minute. From this point on respiration is either controlled, assisted, or by diffusion; therefore it is not important that respiratory effort be maintained. Respirations are assisted or controlled by manual compression of the breathing bag filled with 100% oxygen for 30 to 60 seconds until maximum oxygenation is obtained and carbon dioxide is worked out. With sufficient muscular relaxation, the patient is positioned for bronchoscopy by placing a folded pillow posterior to the mid-dorsal back, with the number two nurse supporting the head. One hundred per cent oxygen delivered at 8-10 liters per minute through the side-arm of the scope maintains oxygenation by diffusion respiration sufficiently to permit bronchoscopy of average duration. If a longer procedure is required, diaphragm contractions can be initiated by slowing or stopping the succinylcholine drip. Coughing and straining to deliver secretions to the range of the broncho-

scope may be continued for long periods with considerable patient activity and with complete amnesia. Three or 4 cc. of Pentothal solution may be injected intermittently as needed and the flow of succinylcholine varied according to the degree of relaxation desired. If the bronchoscopy is prolonged and progressive bradycardia develops the scope is withdrawn, the anesthesiologist re-oxygenates the patient, and the scope is reinserted. This is rarely necessary. If bradycardia seems to be incident to vago-vagal reflex, 1/150 gr. of atropine sulfate is given via the intravenous tube. If bronchial secretions obstruct the airways and the patient's cardiopulmonary status is poor, he is intubated, suctioned and thoroughly respired, and then the bronchoscopist proceeds.

When bronchography is planned, the patient lies supine on the horizontal fluoroscopy table and bronchoscopy is performed as already described. The anesthesiologist then inserts a cuffed endotracheal tube and the cuff is adequately inflated. A bite block is placed and a strip of 1-inch adhesive with each end bifurcated for several inches is passed around the neck and the ends secured to the bite block and the tube. The oxygen system is attached to the endotracheal tube and manual compression of the oxygen bag is resumed. An 18-inch-long segment of a size 16 French K-10 Kaslow plastic stomach tube attached to the syringe containing the opaque medium is passed through the orifice of the nipple of the right angle endotracheal connector. Hereafter the bronchoscopist directs the procedure and operates the fluoroscopic screen. The patient is placed in the right posterior oblique position with a supporting pillow under the left hip and the number two nurse holding the arms extended to the right. As the bronchoscopist fluoroscopically visualizes the plastic tube it is passed by the anesthesiologist to the desired point in the right bronchus. This is easily accomplished in a large percentage of attempts; if not, it is partially withdrawn and reinserted until in the proper place. Usually, with the tip of the plastic tube at the level of the bronchus intermedius, 10 c.c. of the opaque medium are injected rapidly while the anesthesiologist exerts added pressure on the oxygen bag. The opaque medium is seen to distribute readily throughout the right bronchial tree as the patient is simultaneously rotated toward



the right lateral or even the prone position to insure filling of anterior branches. In the presence of localized or general impairment in pulmonary dynamics or with bronchospasm or bronchostenosis, the opaque medium may not distribute uniformly, necessitating repositioning of the tube and/or instillation of more opaque medium. Frequently, added pressure on the oxygen bag at this point is helpful. Otherwise, coincident with opaque medium instillation and until bronchograms are made, the anesthesiologist maintains only very shallow respirations to avoid distribution of the opaque medium to the alveoli. Occasionally, when a segment or lobe, because of disease, accepts the opaque medium reluctantly with other areas adequately filled, roentgenographic exposures are made and then more oil instilled. With fluoroscopic evidence of adequate filling, the lights are turned on and the patient placed in the right lateral position, the number two nurse holding both arms extended to the right. When the X-ray technician is ready for a Bucky exposure, the anesthesiologist exerts firm pressure on the filled oxygen bag, stopping all respiratory motion at full inspiration. The technician, at a signal from the anesthesiologist, makes the exposure. Studies with the oscillograph reveal a marked bradycardia during this period which has proven to be of no hazard.<sup>(5)</sup> The bradycardia is conducive to technically better roentgenograms with no blurring from heart motion. The anesthesiologist then fully respirates the patient several times and a second right lateral exposure is made. Right posterior oblique exposures are similarly made if desired. The patient is then turned to the left posterior semi-oblique position with a supporting pillow under the right hip and with the number two nurse holding both extended arms to the left. The room is darkened, the plastic tube is partially withdrawn, and the anesthesiologist passes the tube into the left bronchus, utilizing its natural curve. If this is unsuccessful after a few attempts, the tube is withdrawn until its end is at the lower end of the trachea. Under fluoroscopic vision the bronchoscopist then directs instillation of the opaque medium as on the right. With adequate filling, the light is turned on and a left posterior semi-oblique exposure is made. The anesthesiologist then fully respirates the patient several times and a second left posterior semi-oblique and an-

terior-posterior exposure is made. If desired, a post-tussive exposure is made after the patient awakens. Occasionally, in patients with multiple areas of bronchiectasis, information as to tussive emptying of opaque medium is obtained by an exposure several hours later. Upon conclusion of bronchography, controlled respiration is maintained, with intravenous solutions discontinued, until patient resumes normal respirations and he is responding. This usually requires only a few minutes. The trachea and bronchi are repeatedly aspirated with a catheter through the endotracheal tube until thorough coughing is elicited. The endotracheal tube is then removed with adequate toiletry of the nasopharynx and mouth. The patient is kept under constant surveillance until he is fully awake, with repeated cleansing of airways as necessary.

#### CONCLUSIONS

Contrary to general opinion, intravenous Pentothal sodium and succinylcholine may be safely used as an anesthesia for bronchoscopy and bronchography. In a series of 600 bronchoscopies and 285 bilateral bronchograms there were no deaths, no serious operative or post-operative difficulties or complications, and no apparent drug or opaque medium reactions. With careful attention to the details of the procedure as here described, the usual contraindications to intravenous Pentothal sodium in patients with severe cardiopulmonary disability may be considerably reduced. Patients and referring physicians are enthusiastic over the absence of discomfort as contrasted with topical anesthesia. The bronchoscopist can be more thorough and bronchograms are technically better.

#### Case 1.—

A 73-year-old white male with severe dyspnea, orthopnea, and intractable cough to the point of exhaustion, gave a history of chronic bronchospastic bronchitis and far-advanced pulmonary emphysema of 13 years duration. Examination revealed evidence of marked "wetness" of the tracheobronchial tree with inspiratory and expiratory wheezing not relieved by much medication, including cortico-steroids. There was electrocardiographic evidence of right heart strain. Vital capacity was 47% of normal in 8 seconds, increasing to 53% of normal after aerosol Isuprel with the Bennett intermittent positive pressure apparatus. Maximum breathing capacity was 20% of normal, with no increase

after aerosol Isuprel. Oxygen resaturation time (Oximeter) was 70 seconds (normal 10 to 20 seconds). Bronchoscopy for aspiration of accumulated tracheobronchial secretions was done with the patient anesthetized with Pentothal sodium and succinylcholine. Aspiration was continued with intermittent coughing induced by ether insufflation until no more secretions were obtainable. During the 30 minute procedure, 250 mg. of Pentothal sodium were used. Very little succinylcholine was used after the passage of the scope. The patient had no operative or postoperative ill effects and he left the hospital 48 hours later with all respiratory symptoms markedly relieved. One week later vital capacity was 60% of normal and maximum breathing capacity was 40% of normal.

Case 2.—

A 7-year-old white male gave a history of repeated febrile respiratory episodes beginning in babyhood. There had been a persistent chronic cough productive of copious quantities of purulent sputum only partially controlled by frequent use of antibiotics. He was markedly undernourished, cough was frequent and "rattly," and rales were heard over both lungs. Vital capacity and maximum breathing capacity were 40% of normal with no increase after aerosol Isuprel. Gamma globulin was normal, as was the film test for fibrocystic disease of the pancreas. Bronchoscopy and bronchography were done with intravenous Pentothal sodium-succinylcholine anesthesia. Purulent material was observed emanating from all orifices, especially from the orifice of the right upper lobe bronchus. Figures 1 and 2 depict the right lateral and left posterior semi-oblique bronchograms. The patient had no ill effects from the procedure and he was discharged from the hospital on the following morning.

Case 3.—

A 42-year-old white male had been in severe status asthmaticus for ten days. After 3 days of continuous intravenous Aminophyllin and ACTH in 5% glucose in water, the status had not improved and he was becoming exhausted. Similar episodes had occurred at approximately sixty day intervals during the past 2 years. Bronchography had revealed a chronic bronch-spastic bronchitis. During a remission the vital capacity was 60% of normal in 7 seconds and the maximum breathing capacity was 45% of normal. Using intravenous Pentothal sodium-succinylcholine

anesthesia, bronchoscopy was done. With repeated coughing induced by the insufflation of ether, much frothy mucopurulent material was aspirated. During the 40 minute procedure, 350 mg. of Pentothal sodium were used. Very little succinylcholine was required after the introduc-



Fig. 1 — Right lateral bronchogram of Case 2. Importance of upper lobe filling is illustrated.

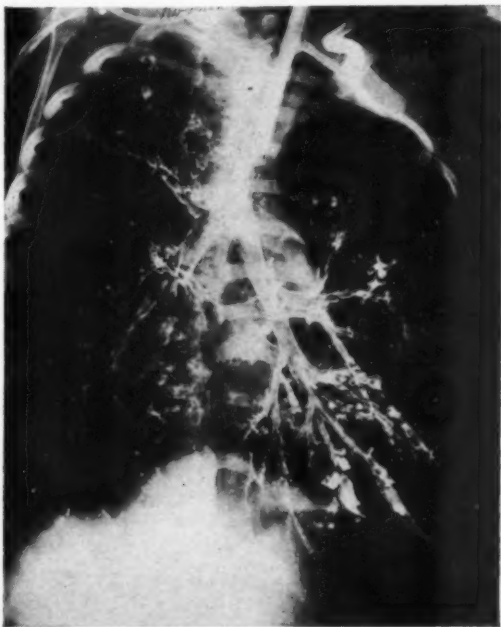


Fig. 2 — Left posterior semi-oblique bronchogram in Case 2.

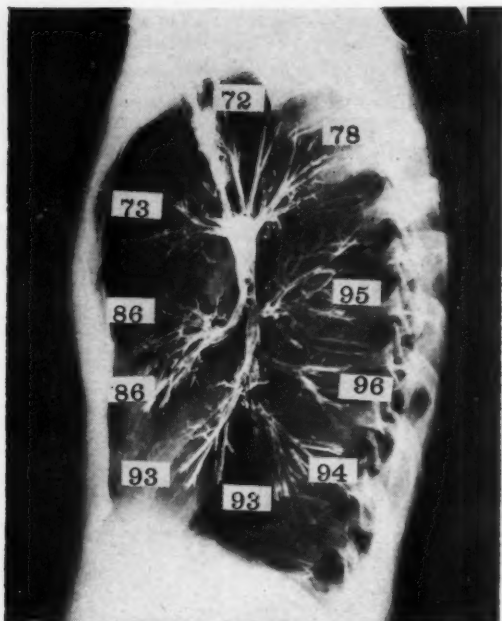


Fig. 3 - Right lateral bronchogram using Viscidol as the opaque medium. Superimposed numbers indicate the percentage of satisfactory filling with opaque medium of each respective bronchopulmonary segment in 285 bronchograms.

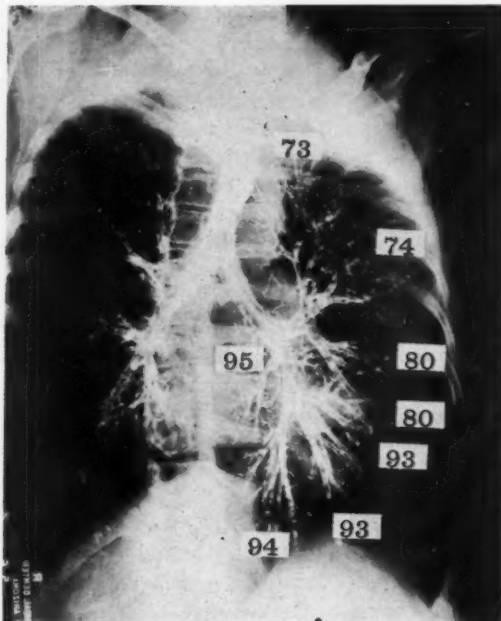


Fig. 4 - Left posterior semi-oblique bronchogram using Lipiodol as the opaque medium. Superimposed numbers indicate the percentage of satisfactory filling with opaque medium of each respective bronchopulmonary segment in 285 bronchograms.

tion of the bronchoscope. Although he was only semiconscious during most of the procedure, he had no memory of it. Twenty-four hours later the status had broken and on the following day he was discharged markedly improved. In spite of the status asthmaticus, there were no ill effects from the anesthesia.

### THE ACUTE SURGICAL ABDOMEN IN INFANCY AND EARLY CHILDHOOD

Charles W. McLaughlin, Jr., M.D.

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**A** CONSIDERATION of abdominal emergencies in infancy and early childhood is essentially a presentation of acute intestinal obstruction in this age group, with a lesser number of cases incident to inflammatory disease, trauma or hemorrhage. During the past twenty-five years this subject has attracted increasing interest with encouraging results in surgical treatment. Many of these problems are congenital and while some are hopeless from a corrective standpoint many are either partially or wholly remedial. This group of cases, therefore, presents a challenge to the surgeon with many disappointments but with a constantly increasing number of successful results.

The most arresting lesion seen in the newborn

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group is the omphalocele. While not essentially an obstructive lesion, these are surgical problems of the most urgent type. These congenital herniae may vary in size from very small, readily repaired defects to almost complete absence of the abdominal wall. Early repair is essential. We prefer to open the sac to permit inspection of the abdominal viscera for associated abnormalities. When tension incident to closure may be hazardous, the two stage method initially closing the skin, with secondary muscle-fascia closure months later, is certainly the method of choice.

In a personal series of 350 patients with acute intestinal obstruction, 83 patients or 24 percent were infants from birth to the age of three

years. These infants were all seen as abdominal emergencies and may be divided under several headings.

Duodenal obstruction, either complete or partial, was observed in 13 infants, the average age on admission being 11 days. The presenting symptom was that of intermittent vomiting since birth, usually projectile in character and containing bile in the majority of instances. Abdominal distention except in the epigastrium was not a feature. Visible peristaltic waves were noted across the upper abdomen in 10 of the 13 patients. A flat abdominal plate usually disclosed a dilated stomach and in some a markedly distended duodenum with little or no gas in the small bowel. Clinically, pyloric stenosis was excluded by the onset of symptoms at birth and the presence of bile in the vomitus.

In 5 of the 13 patients with duodenal obstruction the occluding duodenal band was associated with malrotation of the colon. In 4 cases the peritoneal band occluding the duodenum was not associated with a malrotation of the large bowel. The four remaining cases resulted from various causes including two cases of duodenal atresia, one of non-specific acute duodenitis and one annular pancreas.

Simple division of congenital peritoneal bands was carried out in eight patients. Gastrojejunostomy was performed in four and gastroduodenostomy in one. Three infants succumbed, a mortality rate of 23 percent.

Seventeen infant patients with small bowel obstruction were encountered requiring 20 operative procedures. This group of infants varied in age from one day to two years, the average being six weeks. Symptoms had been present on admission for an average of 8 days.

Intermittent vomiting was again the presenting symptom. Abdominal distention accompanied by varying degrees of dehydration were the principal findings in this group. X-ray examination disclosed small bowel distention with fluid levels in all instances.

In 10 of the 17 patients the obstruction was congenital in origin; in 4 due to acquired peritoneal bands and in 3 it was inflammatory in nature. Specifically the obstruction resulted from congenital and acquired adhesions, volvulus, meconium ileus and congenital atresia and stenosis.

The surgical procedures employed were decompression (5 patients), division of bands (4

patients) and resection or short circuiting procedures (8 patients).

The results in this group were most discouraging in that there were 9 deaths resulting in a mortality of 52.9 percent. Volvulus, meconium ileus, and multiple atresias of the small bowel were responsible for the high mortality. With improvement in technique the results in single intestinal atresias are encouraging.

Meconium ileus remains a distressing condition for which we to date have no satisfactory solution. The systemic character of the disease with fibrocystic changes in the pancreas and an alteration of the mucous glands in both the respiratory and intestinal tracts very often defeat one's best efforts even if temporary improvement results from resection, exteriorization or short circuiting procedures.

Twenty-three patients with intussusception were admitted to the hospital with an average age of 13 months. The mean duration of symptoms for the group was 33 hours but it is very significant that this figure was 60 hours in those cases which resection was required.

In 21 cases the intussusception was ileo-colic in type, in one instance ileo-ileal and in one entirely colic. Barium enemas were routinely used preoperatively for confirmation of the diagnosis and for partial reduction of the classical ileo-colic type. In no instance was the barium enema alone used as the therapeutic measure. We are aware of the practice in some clinics of avoiding operation if the terminal ileum is well visualized.

In 15 of the 23 patients the intussusception was reduced manually while resection was necessary in 8 instances. There were 3 deaths in the entire group — or a 12.6 percent mortality. Two of the 3 fatalities followed resection, 1 from shock and 1 from a post-operative pulmonary complication. The third death resulted from gangrene of the ileum occurring on the fifth post-operative day, apparently due to vascular thrombosis after a simple reduction of an ileo-colic invagination.

Our experience with these infants confirms the prognostic significance of the duration of symptoms and the pre-operative temperature. The late cases with distention and a temperature above 102 degrees after hydration have generally required resection. In these infants the decision to proceed with resection should be made promptly without undue trauma or ma-



nipulation. We feel that if one cannot accomplish the reduction promptly with gentleness, utilizing the various accepted methods, it is better to proceed immediately with resection.

Six patients with imperforate anus were included in this series, the average age being 24 hours on admission. Until recently x-ray examination was always made with the child in the inverted position to estimate the length of the defect. Accurate information can only be obtained by this study when abdominal distention is marked. The same information may be obtained prior to the development of distention by forcibly flexing the thighs on the abdomen and in this way increasing intra-abdominal distention and thus force the blind lower intestinal segment as far as possible into the perineum.

In 4 cases the perineal defect was less than 2.5 cm. and perineal continuity of the bowel was re-established. In the remaining two the rectal pouch ended blindly above the pelvic peritoneum necessitating exploration and colostomy.

It is our practice to explore abdominally all infants with a perineal defect longer than 2.5 cm. In well developed babies of normal weight a primary attempt may be made at this operation to re-establish intestinal continuity from above. In premature and underweight infants we favor colostomy alone at the primary operation with a subsequent procedure to bring the rectal pouch into the perineum.

In this small series there was one death, a mortality of 16.6 percent. This infant had, in addition to its imperforate anus, multiple congenital defects of its urogenital system.

Incarceration is the most common complication of inguinal hernia in this age group whereas strangulation rarely occurs. In our own series of 298 infant herniae, 26 patients varied in age from one day to three years but 69 percent of the group were under three months of age. In this group 73 percent were male infants and 27 percent females. Symptoms had been present on admission for an average of 10 hours.

The classical symptoms were those of a painful irreducible swelling in the groin in a very fretful infant. In only one instance was abdominal distention noted. This is one type of obstructive lesion which is usually seen very early and offers relatively little problem in differential diagnosis. Hydrocele and inguinal

adenitis are the two principal conditions to be excluded.

In 5 cases of this series the hernia reduced while anesthesia was being induced but the operation was proceeded with in each instance. In those small patients in which reduction occurs after hospital admission prior to surgery, operation is always advised during the hospital stay, but a delay of two or three days is helpful to permit edema in the canal to subside.

In the 26 cases which were operated upon as surgical emergencies, red but viable ileum was found in the sac in 16 cases, the cecum and appendix in two cases and the tube and ovary in eight cases. In one of the latter infants, the tube and ovary were gangrenous necessitating removal — this being the only instance of non-viable tissue encountered.

Surgical reduction with high sac ligation and a limited Fergusson repair was carried out in all 26 infants without mortality.

Peptic ulcer, while admittedly a rare lesion in this age group, occurs somewhat more frequently in infancy than in childhood. Gross estimates that approximately 350 instances of this condition have been recorded in the literature.

Peptic ulcer in infancy is relatively asymptomatic and in a high percentage of cases the lesion is unsuspected until the time of autopsy. Peptic ulcers in the very young may give rise to (1) Malnutrition and repeated gastric upsets; (2) Exsanguination or even fatal hemorrhage; (3) Perforation into the general peritoneal cavity; (4) Mechanical obstruction from cicatricial tissue near the pylorus. In general severe bleeding or perforation is more common in the infant while obstructive symptoms are more apt to appear in older children.

We have observed but one instance of a perforated peptic ulcer in a female infant two days of age. It became fretful and developed rather marked abdominal distention with muscle guard soon after birth. Abdominal plates in the flat and upright position disclosed a large quantity of free air beneath both diaphragms. At operation a perforated gastric ulcer on the lesser curvature was found and closed by simple suture with prompt recovery of the infant.

Acute appendicitis remains the most common urgent abdominal condition requiring surgical intervention in the pediatric age group. In a compilation of 586 consecutive laparotomies in



infancy and childhood at the Childrens Memorial Hospital in Omaha, acute appendicitis was the surgical diagnosis in 300 cases or 51 percent, followed by intussusception, (42 cases), 7 percent; intestinal atresia and stenosis, (27 cases) 4.6 percent; traumatic abdominal lesions, (18 cases) 3 percent; Meckel's diverticulum (17 cases) 2.9 percent and incarcerated hernia 2.7 percent.

It is well appreciated that acute appendicitis is rare under the age of one year and quite infrequent before the second year. Thereafter through the years of childhood it rapidly increases in frequency. In our own series only 6 cases were seen under the age of two years, the highest instance being noted between the eighth and tenth years.

An analysis of symptoms is difficult to evaluate when many of the patients are admitted before the sixth year. It is noteworthy, however, that when a good history is obtainable it follows the classical accepted sequence of Cope in 74 percent of the entire series. If one considers only those cases found to have diffuse suppurative appendicitis, perforation or abscess, the classical symptom complex was elicited in 90 percent of these small patients.

The only reliable physical finding we have come to depend upon is localized tenderness with or without muscle guard or rigidity. This finding in the infant and childhood group is quite as reliable as in older patients and was the one physical finding consistently present in the series. When combined with rectal examination which may be very helpful in this group of young patients, the necessary information may usually be obtained on examination.

This group of cases was operated upon by the attending surgical staff of the Childrens Memorial Hospital so that there was some difference in the technical management of the series. A McBurney incision was employed in 60 percent, a transverse incision in 17 percent, a right rectus incision in 15 percent and a Davis or paramedian incision in 8 percent. The appendiceal stump was simply ligated in 87 percent and inverted following ligation in 13 percent. Of those cases which were perforated but without a definite abscess 58 percent were closed with drains into the peritoneal cavity. The remaining cases in the perforated group without abscess were closed tight without serious complications.

The 10 cases of appendiceal abscess merit comment. They had been ill on an average of 6½ days on admission and some were toxic when first seen on the surgical service. After suitable preparation with fluids, blood if indicated, and antibiotics, 8 of these 10 cases were operated upon. In 3 only drainage of the appendiceal abscess was accomplished with subsequent appendectomy 3 months later. In 5 of 8 cases primary appendectomy with drainage of the abscess was carried out. Two cases were handled conservatively with resolution of the abscess and the recommendation that subsequent appendectomy be performed. It is noteworthy that these 2 cases have not returned for secondary appendectomy and this definitely represents one of the hazards of this method of treatment if one does not have an understanding and cooperative family.

In this series of cases of acute appendicitis including those with perforation and abscess there was no mortality. This improved picture in acute appendicitis is due to prompt surgery when indicated, better anesthesia and a general understanding of fluid balance and antibiotic therapy.

Any discussion of the acute surgical abdomen in infancy and early childhood would be incomplete without reference to the problem of massive intestinal bleeding in this age group. In general if blood dyscrasias are excluded, extensive rectal bleeding in infancy and early childhood results from (1) Intussusception; (2) Meckel's diverticulum with ulceration and (3) Rectal polyps with bleeding. In our experience intussusception and rectal polyps can be readily excluded by accepted diagnostic means but the diagnosis of a bleeding Meckel's diverticulum is usually made by exclusion. We believe that if the other common causes are not demonstrated, exploration is indicated with a tentative diagnosis of a bleeding Meckel's diverticulum.

#### DISCUSSION

The diagnosis and treatment of abdominal emergencies in infancy and early childhood offer a challenge in mechanics and physiology for those interested in pediatric surgery. History often may be limited and information must, on occasion be obtained largely by physical examination and through competent x-ray assistance.

There are certain principles in the management of these patients which must be constantly

followed if a lowered mortality is to be obtained. The surgeon must realize that the physiologic balance in the newborn and young infant has not had time to develop its resources and this is especially true in the premature. One must accept an instability of temperature regulation, low respiratory and cardiac reserve, relatively low values for plasma proteins and a tendency to electrolyte imbalance.

Blood and intravenous fluids are necessary in the pre- and post-operative periods in practically all newborn and infants requiring major surgical procedures. Since the infant has a limited cardiac reserve and marked susceptibility to edema, fluids should be given by slow drip preferably through a polythene cannula in the long saphenous vein. We agree that more harm is done by giving too much fluid than by keeping these small patients on the dry side. Electrolytes should be limited because the immature kidney has limited ability to excrete these substances. A working rule in small infants is to give 35 to 50 cc. per pound every 24 hours by the intravenous route, using 10 percent glucose in water. The amount of saline solution administered should vary from  $1/6$  to  $1/3$  of the total daily fluid volume, depending upon chloride loss through vomiting or gastric suction. Blood must always be available and we routinely transfuse all infants undergoing major surgical procedures, giving 10 cc. per pound of body weight.

Decompression of the small bowel by suction is rarely feasible but gastric lavage is essential to assure an empty stomach during anesthesia and to facilitate exploration. Before and after operation, intermittent gastric aspiration, using a No. 8 urethral catheter, is preferable in the premature. In infants of normal development a Levins tube with Wagensteen suction may be safely employed, provided it be withdrawn in 48 hours.

Adequate anesthesia, usually with open drop ether or Cyclopropane is essential and an experienced anesthetist who can vary the depth as required is an invaluable aid. A high oxygen level, both during operation and in the post-operative period must be provided.

Incisions employed should be ample for adequate exploration to avoid undue trauma through retraction. In malrotation, volvulus and the atresias it is usually expedient and necessary to deliver the entire small bowel and a portion of the colon to permit orientation and repair.

Enterostomy and exteriorizing procedures should be avoided if possible in the surgery of infants. The early re-establishment of intestinal continuity is most desirable to reduce fluid loss and permit early feedings.

Time is an important factor and gentleness with the rapid performance of a procedure will carry many seemingly hopeless problems through to recovery.

## PHOENIX *Clinical* CLUB

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

### MASSACHUSETTS GENERAL HOSPITAL PRESENTATION OF CASE

A 28 YEAR old man was admitted to another hospital on March 13, 1951 because of fits and unconsciousness of 45 minutes duration. On the day prior to his admission he complained of

chilly feelings, headache, and chest pain, and reported to the physician at his place of employment. He was found to have a slightly elevated temperature and was sent home. Three-quarters of an hour prior to his admission, his wife found him convulsing and brought him directly to the hospital.

Past History: In April 1945, while in Germany with the Army, he developed slowly progressing stupor, with headaches, nausea, vomiting and diplopia. A diagnosis of brain tumor was made and he was transferred to an army hospital. Investigation there revealed some chest abnormalities as well, and biopsy of a supraclavicular node yielded the report "Hodgkin's paraganuloma." Radiation was given to the

chest and head (amount and physical factors not available).

Except for occasional severe headaches he got along well until February 1947 when he had a seizure. This began in the left hand and progressed to involve all extremities. The frequent recurrence of such seizures led to his admission to a naval hospital in August 1947, where he was given a course of radiation to the head. During the radiation treatments he developed a partial paralysis of his right lower facial muscles, but this cleared after a few weeks. In addition to the seizures described above, he developed six to eight attacks a day in the course of which he stared into space, ceased all activity, and was oblivious to his surroundings. Later he had no memory of such episodes. At times he put his clothes on backwards. Tridione was given for these attacks but the frequency of grand mal attacks increased so alarmingly that this drug was discontinued.

His seizures continued every three or four months, and in 1949 he noted "dancing lights" prior to the convulsions. He remained well otherwise and was able to work.

In April 1950, during the course of an upper respiratory infection, he had a much more severe attack than usual. He was admitted to the Boston City Hospital. A lumbar puncture done at this admission showed an initial pressure of 140 mm., 8 lymphocytes, negative Pandy, total protein of 43 mg. per cent, and a gold sol of 122211100. The blood and cerebrospinal fluid Hinton were negative. After discharge he had no further seizures until the present illness, except for occasional "staring spells."

Physical examination: Temp. 107°F. Pulse 160. Blood pressure 70/30. The patient was slightly obese. He was convulsing almost continually when first seen, and there were clonic movements of both arms and legs. The seizures lasted three to five minutes, and recurred after 30 seconds. During these brief intervals of freedom from seizures, the arms were held in semiflexion and the legs in extension. The eyes were closed and the jaws clenched; the patient was very cyanotic and there was a pink froth coming from his mouth and nose.

The left pupil was dilated and neither pupil reacted to light. The optic fundi were natural. No reflexes were obtainable.

No skin rash or adenopathy was found. The lungs were clear, the heart was not enlarged.

The abdomen was negative except for the liver which was palpable two fingers below the costal margin.

A mouth gag was put in place and administration of nasal oxygen was started. Suction was used frequently. Fifteen minutes after admission he was given 3¾ gr. of sodium Amythal intravenously, with prompt cessation of seizures. Carotid sinus pressure failed to show the heart rate. An electrocardiogram showed only auricular tachycardia. Sponging with ice and alcohol failed to reduce the temperature, which remained at 107°F.

Although free of seizures for the next two hours, he remained unconscious. Seizures started again with clonic jerking of the right arm, followed in a few minutes by less intense clonic movements of the left arm. These became generalized and lasted for five minutes after which he was given 5 gr. of sodium Luminal.

Respiration ceased shortly after this. Heart sounds became slow, faint, and irregular, and he expired, two and a half hours after admission to the hospital.

#### Dr. Marriner W. Merrill

The case for discussion today is interesting from many standpoints, not the least of which is that I am afraid it may contain what is popularly known as a "red herring." It involves a young man who died apparently in status epilepticus after an illness that lasted for six years, first appearing when the young man was in the army. At that time he developed symptoms highly suggestive of a brain tumor, including headaches, stupor, nausea, vomiting and diplopia. When examined, however, enlarged lymph nodes were found in the neck and he had some chest abnormalities as well, the details of these findings being left pretty much to the imagination. We do know that a cervical node biopsy was reported as a Hodgkin's paraneoplasia and that subsequent X-ray therapy to the head and chest gave him almost complete remission of his symptoms for a period of nearly two years. He then developed epilepsy and his seizures became frequent and severe enough to require hospitalization, at which time he was given another course of X-ray therapy to the head. From then until his death patient had variable types of seizures or spells and was hospitalized one more time when a lumbar puncture was done that failed to throw much light on the situation. Following the spinal tap

MAPS

THE WORLD  
ON AN OLD GLOBE



ACHRONY

43



# ACHROMYCIN<sup>\*</sup>

Tetracycline Lederle

in the treatment of

## respiratory infections

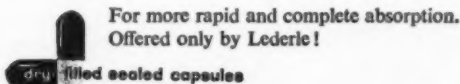
January and his associates<sup>1</sup> have written on the use of tetracycline (ACHROMYCIN) to treat 118 patients having various infections, most of them respiratory, including acute pharyngitis and tonsillitis, otitis media, sinusitis, acute and chronic bronchitis, asthmatic bronchitis, bronchiectasis, bronchial pneumonia, and lobar pneumonia. Response was judged good or satisfactory in more than 84% of the total cases.

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<sup>1</sup>January, H. L. et al: Clinical experience with tetracycline. *Antibiotics Annual* 1954-55, p. 625.



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he remained able to work for about a year, when some sort of an infection, probably respiratory, seemed to initiate the final episode of convulsive seizures.

The differential diagnosis of this problem seems to me to fall into three categories. First, did this man have Hodgkin's disease and was an extension of this pathological condition to the brain responsible for his death? Secondly, was the diagnosis of Hodgkin's paraganuloma wrongly made and did the patient actually have some other primary lesion of the brain which progressed to a fatal termination? Or, third, was the cause of death unrelated pathologically to either Hodgkin's disease or a primary brain lesion?

Let us consider Hodgkin's disease first. This man apparently did have a number of things which seem to be highly suggestive that this pathological entity existed. He had enlarged nodes in his neck, some chest abnormalities and most conclusive of all, if we are going to accept the pathologist's report, he had a positive biopsy report. This entire situation may be a red herring, but it is hard to discount. Then, as we all know, Hodgkin's disease has many and protean manifestations and involves many different tissues and areas of the body, including the brain and the central nervous system. Furthermore, in many substantiated cases, X-ray therapy has induced remissions in this disease for many years. On the whole, I find it difficult to say this man did not have this disease. Whether or not a progression of the intracranial involvement was responsible for the development of epilepsy and the terminal episode may well be another matter, however.

If we are going to consider that this man had some other intracranial lesion besides Hodgkin's disease, we are treading on dangerous ground. For we must either accept the proposition that this man had two different lesions existing concurrently, both of which were treated at the same time by X-ray and both of which showed response to this therapy, or we must throw out all the information relative to the Hodgkin's disease, assume the man had a brain tumor, and that this tumor was pretty well held in check by roentgen therapy for a period of six years. This line of reasoning seems a little far-fetched. Consider for a moment that this may have been a brain tumor. There is not a great deal of information to help us localize

an intracranial lesion, but it would have to be in a relatively silent area of the brain and probably in the temporal lobe, possibly on the right side. Some of the staring spells and periods of temporary amnesia suggest a temporal lobe lesion. If the lesion were located in the temporal lobe it would most likely have been a glioma and it is conceivable that the two courses of X-ray therapy held the disease in check for six years. In fact, enough in check that this man was able to pursue a gainful occupation up until a day or so before his death. A cystic degeneration of a rather large temporal lobe lesion may possibly have precipitated the final episode. I hope I am not discarding the true diagnosis, but I do not believe this man had a primary brain tumor. Furthermore, I am going to apply this line of reasoning to any of the other pathological conditions that might exist as primary intracranial pathology, and discard them also.

For a moment or two it might be well to recount some of the neurological manifestations. It is of interest that the first symptoms suggested the development of intracranial pressure, the nausea and vomiting, the progressive stupor, the choked discs and the diplopia. Yet after the first X-ray treatment increased intracranial pressure was no longer a factor, even until the time of death, and the various types of epileptic manifestations became the prominent factors. Even these did not fit a uniform pattern. Apparently the first seizures began in the left hand and spread into generalized convulsions. Later he developed spells of staring into space followed by temporary periods of amnesia and failure of recollection of these attacks. At one time he had a partial, temporary paralysis of his right lower facial muscles, and still later he began to notice dancing lights preceding the convulsive states. The final episode was that of death in status epilepticus.

Going back now to Hodgkin's disease. Following the initial description of the condition, no further mention is made of the recurrence or presence of this disease and we must assume that if it were not the cause of death, it had been arrested by the X-ray therapy to a point where it was no longer clinically obvious. I think we can assume that the disease was under clinical control from the treatments, both in the chest and neck and very likely in the C. N. S. as well. Where do we go from here then to account

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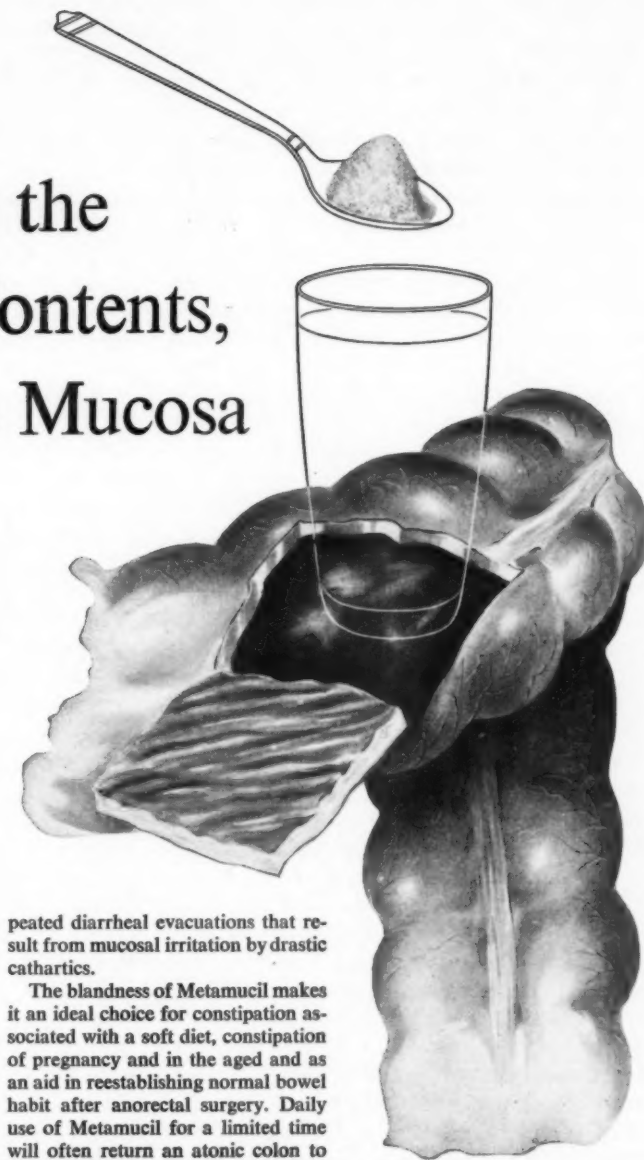
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SEARLE

for this man's epilepsy and the terminal episode?

At this point I would certainly like to know just how much irradiation this patient's brain was subjected to, and what the portal of entries were. X-ray therapy is capable of producing scarring and destruction of brain tissue as well as other tissues of the body. The development of brain damage following X-ray therapy is a known fact, as in the development of epilepsy. Here then is a patient known to have Hodgkin's disease in the chest and neck and probably also in the brain. On two occasions he has irradiation therapy to the head, the extent of which we do not know. We do know that his symptoms changed after the first treatment. Formerly he had symptoms of an expanding lesion and increasingly intracranial pressure. Two years after his first treatment he has his first seizure and from then on he is never free from them until he dies. Furthermore, these seizures do not suggest one isolated lesion or area of scarring, but more of a diffuse involvement. Why he suffered from such a violent episode as to cause death is a mystery, but then why status epilepticus develops in some patients is not clearly known. All in all, I think I am willing to accept that this man originally had Hodgkin's disease, but died from the aftermath of the treatment of this condition, the X-ray therapy.

#### CLINICAL DISCUSSION

Dr. Denny-Brown: In April 1945, while in Germany with the army, the patient developed slowly progressing stupor, with headaches, nausea, vomiting and diplopia. It is assumed that this patient had increasing intracranial pressure. The further assumption seems to have been made that since there was a lymphadenopathy reported to be Hodgkin's paraganuloma and cerebral Hodgkin's disease. But several questions arise immediately, first whether brain tumor caused the increased intracranial pressure. Though the patient had increased intracranial pressure and damage to one or more cranial nerves, it will be noted that there was no sign relating to damage of the brain itself. The way in which Hodgkin's disease ordinarily affects the nervous system is by extension to the extradural spaces. In that manner compression of the spinal cord is commonly caused and occasionally extradural deposits in the skull damage cranial nerves. We therefore suspect that the diplopia was arising from some cranial extradural deposit rather than from cerebral metastasis. But

what of the headache, nausea and vomiting? If the extradural deposit was large enough, it would displace the intracranial contents, or it could occlude one or more venous sinuses. But another difficulty is that we are told the biopsy showed paraganuloma, and this, being the most benign form of Hodgkin's disease, doubtfully if ever affects the central nervous system at all, according to Jackson and Parker and Sparling, Adams and Parker. If Hodgkin's disease does affect the nervous system, it is by the extradural extensions of either Hodgkin's granuloma or Hodgkin's sarcoma. There are cases on record of primary Hodgkin's sarcoma of the brain, but they are found primarily in the cerebellum, curiously enough without evidence of lymphadenopathy. There are reports of reticulum cell sarcoma occurring primarily in the temporal lobe, but in these cases there was also no lymphadenopathy. Since there was a presumed mediastinal mass with affection of lymph nodes, we must conclude that Hodgkin's granuloma was the probable pathology and that an extradural deposit in the skull was the cause of the cranial symptoms. The only explanation of the biopsy report is that the gland section by chance showed a more benign appearance leading to diagnosis of paraganuloma.

Except for occasional severe headaches, the patient got along well until February 1947 when he had a seizure. This began in the left hand and progressed to involve all extremities. The frequent recurrence of such seizures led to his being given a further course of radiation to the head in August 1947. During the radiation treatments he developed a partial paralysis of his right lower facial muscles, possibly due to swelling of the parotid gland, since this cleared after a few weeks. His seizures persisted, however, and now developed features which clearly pointed to a temporal lobe focus. He developed six to eight attacks a day, staring followed by confusion.

The attacks began in the left hand, and the staring followed by confusion was the "dreamy state" of temporal lobe epilepsy. Such an attack may be preceded by an abnormal odor or it may be associated with visual hallucinations, but the absence of these does not lessen the significance of the "dreamy state" which is a temporal lobe attack. The visual aura appeared later in 1949, and was of the poorly organized type associated with posteriorly placed lesions.

That the patient was given Tridione indicates that the seizures were considered to be petit mal. Whatever his electroencephalographic findings may have been, the most important differentiation in relation to all epilepsy is that between focal epilepsy and general epilepsy, an attack beginning locally or beginning generally. A focal onset means a focal pathology. If a patient stares into space, ceasing all activity for a number of minutes, he is not suffering from petit mal. It seems quite obvious that this patient was suffering from focal epilepsy. I doubt whether the seizures were related to recurrence of cranial tumor. There is no further mention of headache, nausea, vomiting or diplopia.

In April 1950, he had a much more severe attack than usual in the course of an upper respiratory infection. He was admitted to the Boston City Hospital, and I remember seeing him at that time. We could find at that time no evidence of damage to the brain except focal right temporal lobe epilepsy and a few lymphocytes in the spinal fluid. It was suggested that scarring of the temporal lobe was the cause of the attacks. This impression was confirmed by a pneumoencephalogram which showed a dilated lateral ventricle on the right side. We could find no evidence of lymphadenopathy in chest, neck or elsewhere. This will explain why he was treated conservatively with phenobarbital. He did not require as much treatment as had previously been given. He got along quite well and was doing some work with occasional mild attacks until the last illness which brought him into the hospital on March 13, 1951, a little over a year later. He was then brought into the hospital in a series of convulsions, preceded by malaise and fever for one day.

Recovery of consciousness did not occur and we may call the condition status epilepticus. This is an arbitrary definition. Status epilepticus is in fact only an extreme form of periodic grouped seizures and may in fact begin with a series of attacks with recovery of consciousness between attacks. More usually a sudden onset of perhaps 20 attacks the first day is followed by 40 or more the second day and then 60 a day for several days, then a diminishing frequency in similar steps in sequence of 60, 40, 20, 0. It may be seen in the same patient on another occasion as one attack one day, three the next, five the next, three the next, two, then one. In the second occasion consciousness

may be retained in the intervals. It is important to recognize that epilepsy which occurs in periodic bursts of attacks may take the form of "status epilepticus." The important feature is increasing frequency to a peak which is followed by a natural decline in frequency until the next episode. The interval between episodes may be months or years; in some patients there are only one or two in a lifetime. This patient then, I would say, was suffering from status epilepticus. The attacks were generalized whereas they had been focal before, but in status epilepticus generalization is the rule in spite of focal cause. In addition there was a fever, which is a regular feature of status epilepticus known since its description by Bourneville. That one pupil was dilated was probably only an indication of asymmetrical exhaustion of the brain. The attacks responded to intravenous medication, and as soon as the attacks began again the physicians used a further large dose of intravenous barbiturate. This unfortunately is a common practice. The aim seems to be to suppress the attacks at all costs. Analysis of a number of cases of status epilepticus by Robertson and myself some years ago showed that whatever the intensity of treatment it reaches a peak frequency and then declines. The peak frequency of the episode is delayed by heavy sedation, but status epilepticus has a tremendous momentum and requires very high doses of sedatives to cause even a temporary halt. In the treatment of status epilepticus we should not be afraid of the recurrence of the attacks provided they are not such as to progressively embarrass the patient's circulation and respiration. The epilepsy should be allowed to continue in mild degree until its crisis is passed. To try to keep convulsions entirely suppressed only leads to overdosage of therapy. It appears to me that something of that sort happened here. Shortly after this, his respirations ceased, heart sounds became slow, faint and irregular, and he expired within a short time after admission to the hospital.

We are no doubt expected to implicate a recurrence of Hodgkin's disease in this terminal event. But how could a tumor, after this long interval of freedom, suddenly in the course of a few hours cause all this disturbance, unless by causing a subarachnoid hemorrhage or by causing an acute hydrocephalus? In either case the symptoms would not be these. This picture





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to me is the onset of status epilepticus in a patient who had already an epileptic tendency. But the epilepsy necessitates a residual scar. How could such a scar arise from a cranial lesion? When I saw this man in 1950 I was impressed by the fact that he had very little hair left on the right side of his head. He had evidently had extremely intense X-ray therapy, directed almost entirely to the right temporal region as judged by the depilation. Therefore I think it likely that the temporal lobe epilepsy and status epilepticus were the result of the intense X-ray therapy and not the Hodgkin's disease. If this was an extracerebral deposit of Hodgkin's disease in the beginning, it would have been situated at the base of the skull, and terminal residual scarring there would be unlikely to be an epileptic focus. Status epilepticus is an illness with extremely high mortality, but I would also feel that 8¼ gr. of intravenous barbiturate must be blamed in part for the final outcome. I would conclude that the condition was status epilepticus from temporal lobe damage following irradiation, complicated by barbiturate intoxication, with a history of Hodgkin's granuloma, probably with extracranial deposits now no longer present.

#### PATHOLOGICAL DISCUSSION

Dr. Foley: Postmortem examination was restricted to the head. The dura and the venous sinuses were normal. Dr. Raymond Adams cut the brain after it had been fixed in formalin. The only abnormality on the surface of the brain was a small (0.5 cm.) depressed, orange-colored scar in the second temporal convolution of the right hemisphere, near the junction of the temporal and occipital lobes. There was a small defect in the arachnoid over this scar. The surfaces of the hemispheres were not flattened and there were no temporal or cerebellar herniations. On coronal section, the body of the right caudate nucleus was reduced in bulk and was orange-brown in color. The cortex was destroyed near the scar and the white matter of the adjacent convolutions and the centrum of the right temporal lobe was reduced in bulk and varied from gray to light brown in color. The right internal capsule was thin. Both lateral ventricles were slightly dilated, the right more than the left and the right temporal and occipital horns were more dilated than any other part of the ventricular system. Minute foci of

brownish discoloration were seen in the left globus pallidus and convolutional white matter of the left inferior parietal lobule.

On microscopic examination, the scar seen on the surface and on section consisted of complete replacement of the gyrus by dense gliosis and fibrosis. The rest of the temporal region seen to be affected in the gross showed no change in general architectural pattern. The most striking change was an almost complete loss of myelin sheaths and nerve fibers of the convolutional white matter, with diffuse gliosis. Some nerve cells were lost in the cortex overlying these areas, especially in the deeper layers, and there was some replacement gliosis and liquefaction. There was a diffuse but incomplete loss of nerve fibers with gliosis in the white matter of the centrum of the temporal lobe and in the internal capsule.

Small foci of necrosis with hemosiderin in the walls of nearby vessels were seen in the globus pallidus. The smaller nerve cells of the caudate were not present, and only a few large nerve cells remained. Replacement gliosis was intense. Hemosiderin in phagocytes was present around many of the blood vessels. The putamen was unaffected.

Mineralized nerve cells were found both in the caudate and at the edges of the zone of necrosis in the temporal cortex.

There were no significant changes in any of the blood vessels.

No evidence of tumor was found in any of the sections of brain or meninges.

The pathologic findings in this case are consistent with the diagnosis of radiation necrosis of the brain. It is remotely possible that the area of complete focal necrosis in the second temporal convolution was the site of radiosensitive tumor, but the incomplete affection of such a widespread area of brain without loss of architectural pattern makes it most unlikely that the entire area or any part of it was involved by tumor. In the light of the pathologic data, it seems more likely that the original intracranial disorder was due to radiosensitive lymphomatous tumor of the meninges. A delayed radiation necrosis of the right hemisphere, with maximum involvement of the temporal lobe and formation of meningocerebral scarring resulted in seizures. Under this interpretation, the additional radiation given for the seizures was ill-advised and probably increased the

original extent and degree of damage in the right hemisphere. Death was due to the seizures and their complications.

In reconstructing this case, we might consider briefly certain facts about the behavior of lymphoma in the brain and its coverings. Hodgkin's granuloma may involve the meninges but does not metastasize to brain substance. Hodgkin's sarcoma may involve brain substance. Yet of all the types the sarcoma is the least radio-sensitive, and for this reason it is unlikely that there was a tumor in brain substance in the present case. One must, therefore, return to the probability of a meningeal Hodgkin's granuloma destroyed by radiation, but with resulting damage to brain substance by the radiation.

This case has many resemblances to those described by Pennybacker and Russell, who reported nine cases "in which harmful effects to the brain have followed standard dosages and technique without serious superficial damage, and at long intervals after the termination of treatment. . . . In brief, the lesion was an extensive subcortical necrosis, maximal in the field which received the most radiation. In some cases the clinical effects came on after a long latent interval with the suddenness of a vascular accident; in others they were slowly progressive, clinically suggesting a recurrence of the tumor for which the radiation treatment had been given."

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# Editorial

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Journal of

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The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.
2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.
3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.
4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.
5. Manuscripts should be typewritten, double spaced, and the original and a carbon copy submitted.
6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.
7. Exclusive Publication—Articles are accepted for publication on condition that they are contributed solely to this Journal. Ordinarily contributors will be notified within 60 days if a manuscript is accepted for publication. Every effort will be made to return unused manuscripts.
8. Illustrations—Ordinarily publication of 2 or 3 illustrations accompanying an article will be paid for by Arizona Medicine. Any number beyond this will have to be paid for by the author.
9. Reprints—Reprints must be paid for by the author at established standard rates.

The Editor is always ready, willing, and happy to help in any way possible.

## EDITORIAL

RECENTLY Civil Defense activities in this state have considered Phoenix and Tucson as prime targets and attempted to carry out "dry runs" to see the effectiveness of handling the problems in these areas. The results were not only disastrous as far as the bombing was concerned but the organization to date is totally inadequate. It is inadequate not because of the men who are attempting to promote Civil Defense but from the lack of cooperation that the members of the medical societies and public in general have afforded to these individuals.

There is no question that these two cities are prime targets, their preparations have been inadequate, the cooperation offered the Civil Defense officials has been minimal and yet we are dealing with a very real danger.

You are quite willing to buy various insurance policies on other matters. There is no question that the purchase of the CD insurance policy of a planned organization is a must in this mid-twentieth century. Further, a planned evacuation of these two communities is a necessity and not an impossibility. Phoenix has the potential to carry this out. Tucson is the only city with a Strategic Air Command Base that does not have an alarm system available to permit its populace at least a chance.

One cannot recommend prolonged training programs but one can recommend that we establish a program and plan that all can follow and have available a trigger mechanism as an alarm system to permit evacuation.

\*\*\*

THE May 31st issue of the New England Journal of Medicine contains an editorial discussing the stand of the ethical committee of the British Medical Association with reference to any physician taking part in either radio or television broadcasting. They have insisted that the medical doctor involved remain anonymous as part of his contract to carry on the broadcast. I am sure this approach must have pre-



elicitated considerable adverse comment from both members of the medical profession and of the lay public for the attitude of the medical man with reference to medical ethics leaves many factors to be understood by the public in general. However, this approach does not seem unreasonable for local and national newspapers have printed medical articles for many years without identification of the author. It is quite obvious that a man might easily appear as a leading specialist in a field and unjustifiably obtain professional advantage over a colleague when acknowledgement in his field should be by the informed members of the medical profession and not by the uninformed public. His standard of practice should be established by his publications, his mode of practice, his contribution to medical discussions and certainly not the ability to perform well on the television screen or in front of a microphone.

This approach presented to us by our British colleagues seems definitely worthy of consideration and should be kept in mind with additional broadcasts on radio and television stations.

• • •

It is inevitable in a new and young state, and I am sure that it exists in the older states, that various groups are accused of running the local and state medical organizations. This dominance by a group is fundamentally a dominance by default rather than through intrigue as inferred. An effort will be made by this Editorial Staff to see that the members of the Arizona Medical Association are informed of the various developments within their Society and as to legislation which may effect them. However, it will depend upon the individuals in the various areas to take an active part in their organization and attempt to bring about the best possible organization, and not complain that a few limited individuals from one sector dominate the entire group.

### MEDICAL ETHICS OF THE AMERICAN MEDICAL ASSN.

IT IS of interest to all practicing physicians that the present principles of medical ethics of the American Medical Association, which have served as a guide for physicians for more than a century, are undergoing an extensive

revision. This action was initiated by the House of Delegates at the recent Chicago meeting and in a recent secretary's letter the following information is contained:

"Every basic principle," the Council report said, "has been preserved. On the other hand, as much as possible of the prolixity and ambiguity which in the past obstructed ready explanation, practical codification and particular selection of basic concepts, has been eliminated."

The previous forty-eight sections have been reduced to ten.

These principles are intended to serve physicians individually or collectively, as a guide to ethical conduct. They are not laws; rather, they are standards by which a physician may determine the propriety of his own conduct. They are intended to aid physicians, in the relationships with patients, with colleagues, with members of allied professions and with the public, to maintain under God, as they have through the ages, the highest moral standards.

The ten proposed sections, representing the essence of brevity, follow:

1. The prime objective of the medical profession is to render service to humanity with full respect for both the dignity of man and the rights of patients. Physicians must merit the confidence of those entrusted to their care, rendering to each a full measure of service and devotion.

2. Physicians should strive to improve medical knowledge and skill, and should make available the benefits of their professional attainments.

3. A physician should not base his practice on an exclusive dogma or a sectarian system, nor should he associate voluntarily with those who indulge in such practices.

4. The medical profession must be safeguarded against members deficient in moral character and professional incompetence. Physicians should observe all laws, uphold the dignity and honor of the profession and accept its self-imposed disciplines. They should expose, without hesitation, illegal or unethical conduct of fellow members of the profession.

5. Except in emergencies, a physician may

choose whom he will serve. Having undertaken the care of a patient, the physician may not neglect him. Unless he has been discharged, he may discontinue his services only after having given adequate notice. He should not solicit patients.

6. A physician should not dispose of his services under terms or conditions which will interfere with or impair the free and complete exercise of his independent medical judgment and skill or cause deterioration of the quality of medical care.

7. In the practice of medicine a physician should limit the source of his professional income to medical services actually rendered by him to his patient.

8. A physician should seek consultation in doubtful or difficult cases, upon request or when it appears that the quality of medical service may be enhanced thereby.

9. Confidences entrusted to physicians or deficiencies observed in the disposition or character of patients, during the course of medical attendance, should not be revealed except as required by law or unless it becomes necessary in order to protect the health and welfare of the individual or the community.

10. The responsibilities of the physician extend not only to the individual but also to society and demand his cooperation and participation in activities which have as their objective the improvement of the health and welfare of the individual and the community.

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Arkansas, Colorado, Minnesota, Nevada, Oregon, South Dakota, Texas and Wisconsin, and partially with some other states.

The Student Health Service personnel consist of two full-time clinic nurses, receptionist, and three physicians, one the Director, and a fourth-time psychiatrist. The Student Health Service clinic is located on the main floor of the Memorial Hospital which is situated on the college campus. This serves the college students and residents of Pullman. Student Health Service physicians are responsible only for the care of college students. Emergency surgical procedures are performed by staff physicians as are certain other surgical cases. Students requiring specialized care beyond the scope of local physicians are referred to specialists in Spokane or otherwise taken care of by the family.

Clinic hours are 9:00-12:00 a.m. and 1:00-5:00 p.m. on weekdays, and Saturday, a.m. Emergencies after hours, weekends and holidays are handled by Student Health Service physicians "on call."

The State College of Washington has an enrollment of approximately 5,500 students — the majority of whom live in college dormitories and Greek social living groups. There are excellent schools of Veterinary Medicine and Pharmacy, as well as other scientific fields, represented at the State College of Washington. The college library has a sizeable collection of medical books and subscribes to numerous journals. This institution is a member of the Pacific Coast Conference and has a full and well-rounded athletic program.

Pullman is 78 miles south of Spokane, Washington, and has a population of approximately 12,500. Cultural activities of the entire area are centered in the college through the many and varied programs offered in Humanities, including music, art, literature and drama. Faculty members and their families have an unusual opportunity for participation in cultural enterprises of the institution. The public school system is excellent and churches of most denominations are active. Apartments and houses are usually available through the College Housing Office.

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# TOPICS OF *Current Medical* INTEREST

## RX., DX., AND DRS.

By Guillermo Osler, M.D.

**I**T WAS promised that we would tell more about the medical newsmagazine 'M.D.' in this month's column. We'll have to take the promise back, which shouldn't break many hearts, but the reason is an odd one. The editor of the potential journal has asked that no review of the 'preview issue' be made, even tho we liked it (which we did). "The newsmagazine does not as yet exist." . . . So we didn't write a word and you didn't read it.

The latest COMBINATION OF DRUGS has been highly predictable. Acetylsalicylic acid, plus prednisolone, equals 'Cordex' (Upjohn). It is logical for the drug companies to use 'shotgun' preparations, and maybe they will add an antacid or, in the Geigy Co., Butazolidine. . . . Incidentally the last-named is now advertised as NOT being steroid-like in its actions, whereas the original effects were vaguely confused with the corticosteroids.

Now we have both sides of the question about a medical school for Arizona. Dr. Norman Ross produced a rousing article in favor of it in the July issue. . . . Dr. D. W. Melick carefully analyzed the situation a year or so ago with a contrary conclusion.

The staffs of hospitals, and even TV audiences, have gotten used to ANESTHESIA MACHINES. They regulate and mix the flow of gases, take pressures, probably contain Coca Cola, etc. . . . The new 'Antoxnestheton,' however, is astounding to almost everyone outside of the Presbyterian Hospital in New York, tho they may have similar ones in a few other places. It controls the use of oxygen and nitrous oxide; samples the expiratory breath; analyzes it for carbon dioxide; and makes automatic changes to regulate the CO<sub>2</sub> content. . . . The 'attendant' is probably necessary, but he might sneak a comic book now and then.

If you were to see a dignified little booklet entitled "1955 Report of the Scientific Director," with Dr. Clarence Cook Little as Chairman of the Scientific Advisory Board you might properly wonder what it was about. . . . If you found that the Board included Cattel of Cornell, Comroe of U. of Penn., Kotin of U.S.C., Reimann of Philadelphia, Rienhoff of Hopkins, and others, you would be even more impressed, tho uncertain. . . . If you found a list of 53 leading medical educators and research workers who were

applying themselves to the study of tobacco, smoke, and smoking it would be clear that the Tobacco Industry Research Committee was fighting back, and in a most organized (and probably expensive way). Very few results of the projects so far. It is hard to see how they could get lost if unfavorable.

More medical journals are placing a brief SUMMARY of the results of their articles AT THE START of the article. 'Modern Medicine' has joined the group. . . . This saves time for the person who scans in a hurry. It saves turning to the end of the article, a habit which physicians have long shared with women readers of mystery stories and novels.

This item is of practical interest only if the ocean comes inland again. Capt. Shaw of the Medical Corps has given an analysis of the physiology of 'WATER SUFFOCATION.' There are notable differences between fresh and salt water. . . . Drowning in fresh water results in profound hemodilution, low sodium values, and such high potassium levels that a fixed ventricular fibrillation may occur. Seventy per cent of the circulating blood may be inhaled fresh water in three minutes. . . . Inhaled salt water produces an immediate hemoconcentration. Sodium goes very high, but the K/Na ratio stays normal. The heart may beat for 6 or 7 minutes. . . . Plasma proteins diffuse into the alveolar bed in both instances, and pulmonary edema may need treatment with diuretics, heart support, and IPP breathing.

**PILLS AND PUNS DEPARTMENT.** — The publication of the pharmacy school at the University of Southern California is called "PHARM/SC."

Dr. Andrew Ivy of Chicago is a man of many words, not all of them controlled by his sponsors. He was somewhat 'detached' for his support of Krebiozen, a preparation aimed at cancer. . . . His most recent newsworthy comment relegates another large segment of our profession to the limbo, — "Surgery will someday become unnecessary. The only cause of death will be eugeria, or the normal aging process. Surgeons do many fine things for patients, but they wouldn't be necessary if the patients had done something for themselves earlier." . . . I wonder how surgeons will do as gerontologists? Or has Dr. Ivy forgotten accidents, fires, infections, etc., which are not prevented by moderation in diet?





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Incidentally Drs. Ivy, Pick, and Phillips have just publicized a 'Condensation of Observations on KREBIOZEN in the Management of Cancer.' . . . They conclude that it possesses palliative potency in the management or treatment of 68% of patients with several different types of cancer. It possesses 'oncolysis' in 50% of patients. . . . These are definite but fairly mild statements.

The Thorazine people (Smith, Kline, and French) have mentioned the "three phases in the adoption of a new drug, — 1. After a wary skepticism it is carried on a wave of enthusiasm to acceptance. 2. Reports and rumors of its limitations and side reactions. 3. Stabilization at its real level of value. . . . This is the course of a good drug. We have often urged here 'Wait and see,' and 'Every substance has its evil face.'

The FAMILY PHYSICIAN has been loaded with responsibilities from two different areas. . . . Dr. Arnold Friedman of Columbia, director of the Montefiore Hospital Headache Clinic, says that psychotherapy is the best treatment for migraine and tension headaches, and that the family M.D. is the one to give it. "Supportive help" and "reassurance" are needed, and he can do it best. . . . Dr. F. J. Braceland of Hartford, Conn., says that if the family doctor (never 'Doc' if he is to be a psychiatrist!) re-examines his practice he will find that chronic, intermittently disabling illnesses are often emotional disorders, psychosomatic ills, or geriatric problems. He must remember that emotional disorders may be superimposed on physical illness; they may complicate it; or they may arise independently. The differential diagnosis of functional versus organic disease is in the hands of the physician, and he must then be in charge of explaining it.

Remember the early days of the Lempert fenestration operation for otosclerosis? It could only be done by its originator; he could only do a certain number of these delicate and time-consuming procedures; and there were no financial allowances for failures, re-operations, or for professional courtesy. . . . A replacement of the operation has been described. The stapes is mobilized, again with great delicacy and magnification. . . . It is a peculiar coincidence that we knew of a doctor's wife from New Orleans who had the Lempert op. in 1935; the cost was \$1,250; the deafness recurred; the current report on a new maneuver is by a Dr. Normann of New Orleans.

A favorite topic in this column has been the 'DESALTING' OF SEA WATER. It has been a wonderful field for inventors, investors, dreamers, crack-pots, and wise men in half a dozen nations. . . . Look who's in it now, tho! The

Saline Water Office of the Interior Department was authorized in 1952 by Congress. It is hoping to complete two experimental models this year, using compression distillation in one and solar distillation for the other. . . . The six different approaches which have been tried are solar, electric membrane, osmotic, freezing, solvent extraction, and ultrasonic vibration. As can be imagined only the gov'mint could afford the cost of the attempts.

## POEM

Frightened patients when they want a cure,

Bid any price and any pain endure;

But when the Doctor's remedies appear

The cure's too easy and the price too dear.

— Daniel Defoe in "The True-Born Englishman" (1701)

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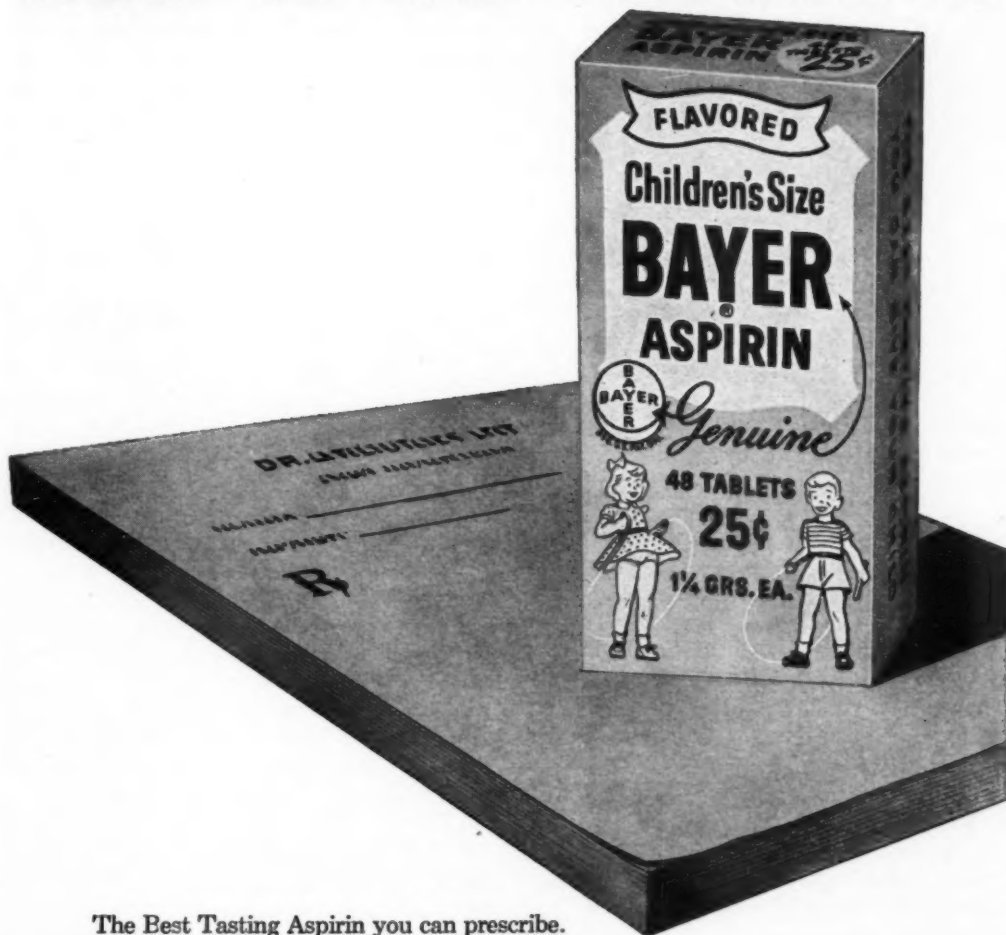
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# Organization PAGE

CIVICS — Norman Ross, M.D.

## A DENTAL COLLEGE FOR ARIZONA

A letter to R. K. Trueblood, D.D.S., F.A.C.D., posing the question, "When?" brought forth the reply that he would request an answer from the Board of Trustees of the Arizona State Dental Association to my question.

Dr. Trueblood's own comment was "Dental Colleges now in existence and those in the process of building are having a tough time hiring and keeping faculties. Many methods have been and are being tried by the colleges to obtain and keep their faculties. The shortage of trained dental teachers is acute. When one college gets a good teacher trained, another will offer him a better salary. And so it goes. ...."

It would appear from the above that if our facilities, and dentistry in particular, are to be staffed that there must be a change in educational programs. We propose a return to the old method which was that of physicians and dentists in the community, possessing proper academic qualifications, adding to their private duties teaching assignments in those colleges. This poses a radical change in the present health educator's concept — a change at national level.

## ARIZONA COLLEGE OF MEDICINE:

"Medical News," Volume 2, No. 15, July 30, 1956, the column "from WASHINGTON:" "WASHINGTON — Look for a major Congressional investigation this fall of complaints that there is a shortage of physicians."

## PRESIDENT EISENHOWER SIGNS

### OMNIBUS HEALTH BILL

More money for Public Health Educator training — and public health.

Arizona's college and universities need approved schools of nursing as well as programs in other health fields to qualify our local students for these benefits.

## ARIZONA ASSOCIATION OF NURSING

HOMES, Post Office Box 5122, Phoenix, Arizona, Charles Schmid, President.

A complimentary letter from Mr. Schmidt

advises, however, that there is and was no reorganization of the Arizona Association of Nursing Homes as stated in the June issue, but that the writer had been contacted by a group who broke off from their parent organization in February of 1956. Mr. Schmid states that this group recently formed an association adopting a name different only in that the name "Registered" is inserted. He recommends that in his opinion the division is only temporary and that the parent organization anticipates a return "to our membership rolls." President Schmid advises that his organization is nationally recognized and affiliated nationally.

• • •

## THE SALVATION ARMY,

Post Office Box 1952, Phoenix, Arizona.

### A DIGEST

of reports concerning the Third National Conference on Solicitations — held at Cleveland, Ohio, March 21-23, 1956.

The need for controls in fund-raising, **FOURTH IN THE LIST OF THIS COUNTRY'S BIG BUSINESSES**, was discussed. .... A suggestion that all health agencies should be merged in the National Health Institute with support from increased federal taxation was not received favorably by most conference delegates.

The Salvation Army observers were struck by the realistic approach to these enormous problems on the part of the representatives of corporations, management, labor, Chambers of Commerce, Better Business Bureaus, welfare agencies and the giving public — and that never once was there any indication that they were ready to forfeit their right to voluntary philanthropy and turn the whole complicated problem over to a department of government.

A new angle introduced in this Conference was a presentation of the urgent need for, and recent upsurge in, corporation support for higher education in this country.

At the conclusion of the Conference it was announced that the W. T. Grant Foundation



of New York City had made a substantial grant to the Conference on Solicitations to conduct a **complete study of solicitation abuses in every area** and to recommend a plan to correct such abuses.

**Laws:** Indications are that, in time, all states will enact legislation to control fund-raising activities, to protect the legitimate agencies and to eliminate the racketeers. Experience demonstrates the need for carefully phrased laws, with sufficient teeth to make them effective.

**Locally:** in addition to municipal laws, Chambers of Commerce and Better Business Bureaus are doing an excellent job in many communities to bring home some kind of order out of chaotic fund-raising activities. They serve as a clearing house for information on fund-raising appeals. There was much discussion about proper format of questionnaires to be used locally to elicit the required information from agencies and all groups conducting public appeals — **and about the dangers of libel involvement in giving such information to the public.**

Representatives of three national health agencies and a speaker for the United Fund of Detroit expressed opposing views on the effectiveness of the United Fund plan as a solution to the fund-raising problem.

Brigadier Henry H. Koerner states that in his opinion a serious drawback to the success of the United Fund Organization is the difficulty experienced in assuring the public that their contribution will go to the support of his or her designated agency in the group. Private charity is seldom all inclusive, particularly in people of low incomes who deprive themselves or their families of luxuries, and at times necessities, by their gifts.

The entire text of this report should be read. Copies will be sent on request.

**AMERICAN FOUNDATION FOR THE BLIND, INC.,** 15 West 16th Street, New York 11, N. Y.

THE EDITOR forwarded a packet from this agency with one item in particular which is worthy of a place in the waiting room, namely, the Annual Report. In that we are frequently criticized for the advanced age of our magazines and periodicals, pamphlets such as the above could be considered as proper reading matter for the reception room. These booklets

are in lay terms, factual, and there is probably no group other than ourselves so well supplied.

The remainder of the press kit included press releases, listing taboos, cliques, misconceptions, as well as editorials and suggestions for articles. We have this great mass of data on file but space soon will dictate the circulation of this material among you members or transfer to some library.

• • •

**AMERICAN MEDICAL ASSOCIATION,  
PUBLIC RELATIONS DEPARTMENT,  
Chicago 10, Illinois.**

Under date of June 1956, attention is called to display racks for health information in waiting rooms of doctors, a program operating at present in Columbus, Ohio, via their Academy of Medicine.

It reports as well the association of medical and legal societies in Montana, Utah, Wisconsin, Virginia, Iowa and North Carolina.

• • •

**JOINT BLOOD COUNCIL, INC.**

1832 M Street, Northwest, Washington, D. C.

A report in which "pertinent information regarding actions taken by the Board of Directors of Joint Blood Council in Chicago June 15, 1956," is acknowledged.

The Board gave the go-ahead signal for projects concerned with collection and dissemination of information, improvements of relations within the blood-banking field, accreditation, and other administrative problems, and scientific research.

• • •

**TOBACCO INDUSTRY RESEARCH  
COMMITTEE**

Paper: Hartnett Cites British Tobacco Tests Failing to Produce Animal Cancer. Will mail out postage paid.

• • •

**STATE GOVERNMENT,** Published by the Council of State Governments.

**ECONOMY IN MENTAL HEALTH**

By Albred Paul Bay, M.D., and  
Paul E. Feldman, M.D.

On the basis of a study of costs at Topeka State Hospital, Kansas, as compared with those at twenty-two other mental hospitals in this part of the country, the authors of this paper contend that expenditures of higher amounts at Topeka for care of each patient saves money in the long run.

## AMERICAN CANCER SOCIETY

**T**HE LONG search by Science for the "mechanism of action" of penicillin may have been narrow considerably by findings at the University of Texas Medical Branch.

Dr. Robert C. Barnett here has resolved part of this modern mystery by producing microthem normal with another common chemical. scopic monsters with the drug and making

The results of this research were announced today by the American Cancer Society, which supports Dr. Barnett's work.

Penicillin, the oldest antibiotic in regular medical use, has been used for almost 15 years to cure and control many of mankind's commonest diseases. But until now very little has been known about how it works — precisely what it does to the chemistry of the bacteria it kills. The same is true of all other antibiotics.

Dr. Bennett discovered that if he placed sublethal doses of penicillin in cultures of sewage bacteria, the bacteria could multiply but not divide. Under the influence of the durg, a bacterium would divide up to the point where the mother cell became two daughter cells — but the daughters could not pull apart. They were stuck together end to end like Siamese twins.

The Siamese twin daughters in turn could continue to multiply — but neither they nor their progeny could pull apart so long as penicillin permeated their medium.

In this manner, Dr. Barnett has grown enormous strings of bacteria. Sometimes 300 or 400 would be stuck together end to end.

The scientist found that if he added to the cultures a bit of ATP (adenosine triphosphate), the string promptly broke up into normal individual bacteria.

ATP exists in all cells as a carrier of energy-laden phosphate. ATP acts as a battery — storing and transporting energy to cell and body sites where it is needed to weld compounds together or pry them apart. It is produced in cell power houses called mitochondria.

These results indicate that penicillin somehow blocks the production or use of ATP; and in this apparently lies the secret of penicillin's ability to destroy disease-inducing germs. The germs take up the penicillin and are destroyed by it; normal cells reject penicillin or detoxify it.

The Texas scientist now is trying to narrow the search for penicillin's "mechanism of action" even more. He is trying to find the precise point in chemistry where penicillin reacts, in some cases, to prevent bacteria from dividing and in other cases to kill them.

## NOTES

1957 Meeting, Arizona State Medical Association, Stardust Hotel, Yuma, Arizona, April 10-13, 1957.

## FISKE ESSAY ON INFERTILITY

The Trustees of America's oldest medical essay competition, the Caleb Fiske Prize of the Rhode Island Medical Society, announce as the subject for this year's dissertation "THE PRESENT DAY TREATMENT OF INFERTILITY." The dissertation must be typewritten, double spaced, and should not exceed 10,000 words. A cash prize of \$350 is offered. Essays must be submitted by January 10, 1957.

For complete information regarding the regulations write to the Secretary, Caleb Fiske Fund, Rhode Island Medical Society, 103 Francis Street, Providence 3, Rhode Island.

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The Manual is being offered at no extra charge to all Senior Medical Students in the six medical colleges in Pennsylvania. Distribution of the Manual to this group will impress the students with the importance of diet therapy in medical practice and will acquaint them with one of the most important educational services of the State Medical Society.

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\*Modell, W.: The Relief of Symptoms, Philadelphia, W. B. Saunders Company, 1955, pp. 265-266.

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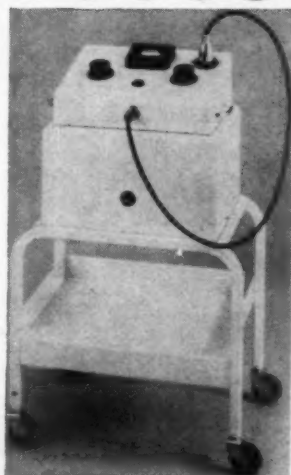
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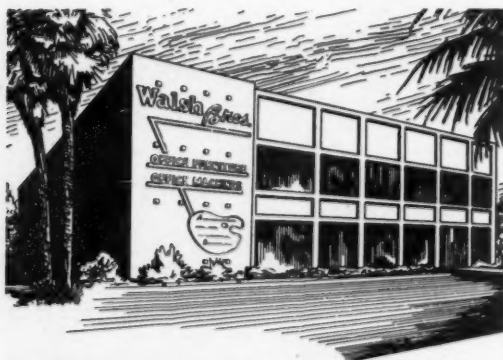




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### A WORD FROM THE PRESIDENT



Mrs. Oscar Thoeny

**T**HIS is the beginning of a new year — the 9-month year when our nation's schools are in regular session. Did you ever stop to consider how much of our life is geared to this schedule? Many clubs refer to this as the start of the club year, whether or not they have school connections.

The opening of school doors affects virtually everyone. If you have youngsters in your home, there is an immediate change in the pattern of your days. When you get behind the wheel of your car, you are sure to notice school areas are being guarded by police and by the children themselves, and extra traffic signs are out. In the hours just before and after school there are increased numbers of bicycle riders and large groups of child pedestrians enroute to and from school. In rural areas, youngsters may of necessity be walking in the roadway.

This Fall change-over in the traffic situation focuses attention on one of our major traffic problems: child traffic accidents. A sense of responsibility and dependability grows as we mature. Being adults we must recognize that

the 5 or 10-year old simply can't be expected to be completely reliable in his safety habits. Our added alertness must compensate for children's mistakes. Give them a chance to learn!

Don't be juvenile and try to compete with bike riders: give them a break. Set a good example for your children by your own alertness and precautions in traffic. You urge them to "eat spinach so you'll be big and strong like daddy." Are you sure you want them to copy your daily safety habits as well?

Check with your children's school to be sure your safety lessons are consistent with its teachings. Confusion is costly here.

Teach youngsters to obey all traffic safety rules at all times. The habits can be formed before children are old enough to understand the reasons behind them, and it is important that the rules be definite and unvarying.

Films available to us on safety for group use: Chain Reaction (16 MM or 35 MM sound-motion) b & w, 13 mins., humorously narrated by Bob Hope: theme, courtesy makes safe driving. User pays shipping charges. Peter and the Whiffle-hound (16 MM sound-motion) col. 10 mins., film illustrates pedestrian safety for primary school levels. Free loan. User pays shipping charges.

Since we know accidents in auto driving are bound to happen, we should try to prevent injuries. If we keep asking for and insisting on padding on the instrument panel and steering wheels designed to absorb shock, we will get them. When you hit a pole at 30 miles an hour (and who drives this slowly on the open highway?) the force is 180 times your weight when you do not have seat belts and only 15 times your weight with seat belts on.

Other films available at the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. c/o Alice C. Mills, Director Women's Activities:

"There's Danger in Darkness" and "Driving at Night."